

MAXWELL JONES

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Double major in **AI and Math** at CMU,
graduating **May 2023**

Research Interests: **Computer Vision, Deep Learning, Multimodal Machine Learning**

Awards/Honors

Siebel Scholar 2024

CMU · Mark Stehlik Introductory and Service Teaching Award

ULSAC (University Leadership Student Advisory Council) CMU 2023-2024

CMU · Phi Beta Kappa (Honor Society)

Skills

PROGRAMMING LANGUAGES

Python

Java

C

JavaScript

HTML / CSS

LaTeX

SQL

Julia

TOOLS/Frameworks

NumPy

Pytorch

SciPy

Unix Command Line

Git

Sklearn

Keras

Pandas

Jupyter Notebook

regex

Matplotlib

OpenCV

Slurm

COURSEWORK

15-485 Intro to Deep Learning

16-385 Computer Vision

10-703 Deep Reinforcement Learning

10-725 Convex Optimization

10-315 Intro to Machine Learning

15-281 Artificial Intelligence

15-210 Parallel Algorithms

15-213 Computer Systems

21-484 Graph Theory

15-251 Theoretical Computer Science

21-301 Combinatorics

HOBBIES/INVOLVEMENT

Panelist: AI Research @ CMU

Panelist: AI Jobs/Internships @ CMU

Judge: WWP Hacks 2022 (HS hackathon, \$5000+ in prizes)

NSBE (National Society of Black Engineers)

Origami Club

Carnegie Mellon Club Basketball

Education

Carnegie Mellon University
MS Machine Learning 2024
Sept. 2023 to Current

Carnegie Mellon University
BS Artificial Intelligence
BS Math
GPA: 4.0/4.0
Sept. 2019 to May 2023

Thomas Jefferson High School for Science and Technology
High School Diploma 2019
GPA: 4.1/5.0
Sept. 2015 to May 2019

University Research

Generative Modeling Research · Carnegie Mellon University
Oct. 2022 to Current

- Research under prof Jun-Yan Zhu in the Generative Intelligence Lab
- Investigating ability to finetune **stable diffusion** models on image to image translation tasks

Semi Supervised Learning Research · Carnegie Mellon University
Fall 2021 to May 2023

- Research under prof Nina Balcan in scalable graph-based Semi-Supervised Learning
- Leverage **K-Nearest Neighbor** graphs and **Conjugate Gradient Method** using **SciPy**
- Perform evaluation on **MNIST**, **CIFAR**, and common NLP datasets (20-newsgroups) with **Sklearn** using Bag of Words
- Achieved **same accuracy, 100x speedup** on large graphs with respect to closed form solutions with matrix inverses
- Used **Image Embeddings** from layer 2 of **Resnet-18** adapted for **CIFAR** in order to clean up more difficult image classification problem
- Accepted at UAI 2023**

Industry Experience

Meta | FAIR Labs
Software Engineer/Machine Learning Intern
New York City, NY
May 2022 to Aug. 2022

- Co-authored paper to benchmark algorithmic **Bias Amplification** of models from biased datasets.
- Using **ResNet-18**, **ClassyVision** and **Pytorch** to benchmark bias for controlled subsets of **The Visual Genome** dataset
- Creating custom datasets, running experiments with **Slurm**, and **Cleaning Data** for **Image Classification**
- Developed **Scripts** to run **Custom Config Files** using both **Bash** and **Python** for large scale hyperparameter testing/analysis
- Managed project tasks** for myself and co-authors on **Computer Vision** FAIR team through weekly meetings, syncs and idea sharing
- Accepted at neurIPS 2022 TSRML Workshop**

Meta | Probability and Uncertainty
Software Engineer Intern
Remote
May 2021 to Aug. 2021

- Developed data perturbation training/evaluating/testing pipeline in **Python**, leveraging **Pytorch** for main testing
- Tested probabilistic models including **Bayesian**, **Ensemble**, and **Dropout** focused networks modeled off of **LeNet-5**
- Evaluated models on perturbed image data (**Random Cropping**, **Rotation**, **Jittering**)
- Used **MNIST** and **FashionMNIST** datasets for testing, Created visualizations using **Matplotlib** for presentation

Carnegie Mellon University
Head Teaching Assistant 15-151 (Discrete Math), Teaching Assitant 15-251 (CS Theory)
Pittsburgh, PA
Fall 2020 to Current

- Over 2+ years, **Head TA for 50+ TAs**, impacting **500+ students** (Concepts of Mathematics, Theoretical CS)
- Responsible for **hiring**, **providing training** and **assessing performance** for TAs
- Contributed significantly to **course structure generation** and **exam creation**
- Design/Lead staff meetings**, coordinate **TA-Professor interactions**, **delegate TA responsibilities**

Fiat Chrysler Automobiles
Data Science Intern
Remote
May 2020 to Aug. 2020

- Worked on amount of absentee workers prediction model across production plants
- Significant increase in model accuracy** for absentee worker prediction at all plants (2% increase, 5000+ employees)
- Improved model performance by using **Random Forests** and **XGBoost**, cross referencing crew attendance across plants
- Queried data from **PostgreSQL** database and used **Pandas** library to store query results

Projects

Cozmo Depth Map! (codebase)
Apr. 2023

- Final Project on team of 2 for Cognitive Robotics at CMU
- Programmed a robot to use **MiDaS**, a monocular **depth estimation** model on camera input with 8 GB GPU
- Given real world sparse depth from aruco markers, calculate optimal scaling factor for relative depth map
- Allow users to query any pixel on screen and output real world depth estimate

Battlecode AI Competition (codebase)
Jan. 2022

- Created **Java** software on small team, for AI bot to compete against other teams in month-long MIT lead tournament
- Combined 500+ person-hours, 2000+ lines of code per year
- Leveraged **distributed** communication **algorithms** and **pathfinding** to increase bot's effectiveness
- Implemented **bit packing** methods, **Priority Queues** and **Stacks**, and **K-Means Clustering** to improve performance
- Placed top 10 out of 250 teams internationally (2021, 2022, 2023), 1st out of all first-time teams(2021), **\$2000+ in prize winnings**

TartanHacks: WalkSafe! (codebase)
Feb. 2020

- Developed a Python program on team of 4 that calculates safe and efficient walking paths at night in New York City
- Created a weighted graph from crime and street data and implemented an **A* Pathfinding** algorithm
- Integrated **Open Street Map API** and fetched data from NYPD crime database REST endpoint

TartanHacks: Spot your Mood! (codebase)
Feb. 2021

- Competed in Carnegie Mellon's main Hackathon on team of 4
- Created an add on for **Spotify** using **Python** and **Flask** to track mood of users listening
- Developed **Vector Embeddings** for mood based on **Spotify API** metadata and sentiment analysis
- Used **Euclidean Distance** in the **Embedding Space** to execute recommendation decisions
- Functionality for both song and playlist generation based on mood factors and specific genre choices